

**ART 34 AMEND**

- 41 -

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CLAIMS

(96)

1. A lock (1, 1') for a door of a motor vehicle comprising:

5 a closing mechanism (3) designed for coupling, in a releasable way, with a lock striker (2) for bringing about closing of said door;

10 a mechanical actuating assembly (4) of said closing mechanism (3), which comprises opening means (30, 38, 55, 57), for controlling release of said closing mechanism (3) from said lock striker (2), and means for inhibiting opening (41, 58), in turn including a first safety member (41) and a second safety member (58), that can be selectively activated for rendering said opening 15 means (30, 38, 55, 57) ineffective, respectively, from outside and from inside the motor vehicle; and

electric-actuator means (5) comprising a first output member (71) coupled with said first safety member (41);

20 said electric-actuator means (5) being housed in a fluid-tight way in a single casing (70) and said first output member (71) traversing, in a fluid-tight way, a through hole (73) of said casing (70) for co-operating with said first safety member (41);

25 characterized in that said electric-actuator means (5) comprise a second output member (72) coupled with

ART 22 AMDT  
said second safety member (58), housed in a fluid-tight way in said casing (70) and traversing in a fluid-tight way a further through hole (74) of said casing (70); and in that said casing (70) defines an area (70a) for 5 housing a manual control device (82, 156) of said first output member (71) and an additional electrical control device (155) of said second output member (72), which provides a function of child safety of said lock.

2. The lock as claimed in claim 1, characterized in 10 that said casing (70) comprises at least two elements (77, 78), which can be coupled together with interposition of first sealing means (81).

3. The lock as claimed in claim 2, characterized in that said first sealing means (81) comprise a gasket 15 (81) co-moulded on a perimetral portion (79) of one (77) of said elements (77, 78).

4. The lock as claimed in claim 2 or 3, characterized in that said holes (73, 74) are made entirely on one (77) of said elements (77, 78) and house 20 respective seal rings (103) co-operating with said output members (71, 72).

5. The lock as claimed in any one of the foregoing claims, characterized in that each of said first and second safety member (41, 58) interacts with said 25 opening means (30, 38, 55, 57) and is displaceable along a pre-set direction between a disabling configuration,

ART 34 AMDT

- 43 -

in which it renders said opening means (30, 38, 55, 57) ineffective and an enabling configuration, in which it enables actuation of said closing mechanism (3) by said opening means (30, 38, 55, 57), and in that each of said 5 first and second output member (71, 72) is provided with a rotational motion about an axis (E, F) of its own, which is transverse to the direction of displacement of the first and second safety member (41, 58) and is provided, in a position corresponding to an external end 10 (110, 111) of its own projecting from said casing (70), with a portion (75, 76) for interaction with the relative safety member (41, 58), said interaction portion (75, 76) being eccentric with respect to said axis (E, F).

15 6. The lock as claimed in claim 5, characterized in that said interaction portion (75, 76) is fixed to an end element (114, 115) coupled in an axially fixed position and in an axially mobile way on said external end (110, 111) of the relative output member (71, 72) 20 and is kept in a pre-set angular position on the external end (110, 111) by said elastic means (116, 117).

7. The lock as claimed in claim 5 or 6, characterized in that said interaction portion is a pin 25 (75, 76) engaged with a through hole (53, 67) of the relative said safety member (41, 58).

- 44 -

ART 34 AMDT

8. The lock as claimed in any one of the foregoing claims, characterized in that said opening means comprise a first actuating mechanism (31) and a second actuating mechanism (32), which can be connected, 5 respectively, to an external handle and an internal handle of said door for controlling release of said closing mechanism (3) from said lock striker (2) respectively from outside and from inside the motor vehicle, said first and second safety member (41, 58) 10 being respectively available in a corresponding said disabling configuration for rendering the respective said first actuating mechanism (31) and said second actuating mechanism (32) ineffective, providing, respectively, an external-safety function and an 15 internal-safety function.

9. The lock as claimed in any one of the foregoing claims, characterized in that said first and second output members (71, 72) have parallel axes (E, F) and are actuated by respective electrical control devices 20 (87, 88).

10. The lock as claimed in any one of the foregoing claims, characterized in that said housing area (70a) of said casing (70) is set on one opposite side of said second output member (72) with respect to said first 25 output member (71), and in that said second output member (72) carries a first attachment element (167),

ART 34 AMDT

- 45 -

which can be connected to said additional electrical control device (155), and a second attachment element (133) which can be connected to said manual-control device (82, 156), said first attachment element (167) 5 being angularly mobile with respect to said second output member (72) and said second attachment element (133) being angularly mobile with respect to said second output member (72) and angularly coupled with said first output member (71).

10 11. The lock as claimed in any one of the foregoing claims, characterized in that said casing (70) integrally defines an insulating body (149) of an electrical connector (148) for connection of said electric-actuator means (5) with an electrical wiring 15 system of the motor vehicle.

12. The lock as claimed in claim 12, characterized in that said casing (70) houses a plurality of warning elements (143, 144, 145, 146, 173) for signalling the operating condition of components of said first lock (1, 20 1'), and an electrical circuit (147) for connection of said electric-actuator means (5) and said warning elements (143, 144, 145, 146, 173) with said electrical connector (148).

13. The lock as claimed in claim 12, characterized 25 in that said warning elements comprise a plurality of microswitches (143, 144, 145, 146, 173), each of which

ART 3A AMENDT

- 46 -

has an insulating portion (154) fixed to said casing (70) and electrical-connection means (150) for connection to said electrical circuit (147) projecting from said insulating portion (154) and embedded in a resin.

14. The lock as claimed in claim 12 or 13, characterized in that said electrical circuit (147) comprises a plurality of conductive paths (152) carried by a flexible support made of insulating material (153) fixed to said casing (70).